Convert Existing Drop Inlet to Junction Box with Manhole will be measured and paid in units of each drainage structure that has been acceptably converted.

Convert Existing Junction Box to Drop Inlet will be measured and paid in units of each drainage structure that has been acceptably converted.

Convert Existing Junction Box to Catch Basin will be measured and paid in units of each drainage structure that has been acceptably converted.

If grates and frames are necessary in converting either catch basins or drop inlets or if frames and covers are necessary for junction boxes, separate payment will be made for the grates and frames or cover and frame in accordance with Section 840.

Such price will include, but is not limited to, excavating, hauling, removal of a portion of the existing structures, disposal of materials, furnishing, transporting, placing backfill material, subsurface drainage, concrete, brick masonry, mortar, grout, reinforcing steel, hardware, casting, miscellaneous metal, fabricating, welding and galvanizing.

Payment will be made under:

Pay Item	Pay Unit
Convert Existing Catch Basin to Junction Box	Each
Convert Existing Catch Basin to Drop Inlet	Each
Convert Existing Catch Basin to Junction Box with Manhole	Each
Convert Existing Drop Inlet to Junction Box	Each
Convert Existing Drop Inlet to Catch Basin	Each
Convert Existing Drop Inlet to Junction Box with Manhole	Each
Convert Existing Junction Box to Drop Inlet	Each
Convert Existing Junction Box to Catch Basin	Each

SECTION 862
GUARDRAIL

862-1 DESCRIPTION

Construct either permanent or temporary steel beam guardrail, in accordance with the contract and at the locations designated in the plans or as directed.

862-2 MATERIALS

Refer to Division 10.

Item	Section
Anchors	1046-5
Guardrail and Barrier Delineators	1088-2
Guardrail End Delineation	1088-3
Hardware	1046-4
Organic Zinc Repair Paint	1080-9
Posts and Offset Blocks	1046-3
Rail Elements	1046-2
Select Material, Class VI	1016
Welded Wire Reinforcement	1070-3

Supply material in accordance with the Department's Brand Certification Program for Guardrail.

Temporary guardrail shall be of the type called for in the plans and shall be fabricated from plates that are at least 12 gauge in thickness. Used materials are acceptable for temporary guardrail construction provided their condition is approved.

862-3 CONSTRUCTION METHODS

Erect the rail elements to produce a smooth continuous rail paralleling the line and grade of the highway surface or as shown in the plans. Lap the rail elements in the direction of traffic. Re-lap the rail elements if required by traffic phasing. Field drill holes for special details. Field punching holes is allowed. Attach terminal sections, when required, to the ends of each installation and lap on the face of the rail.

Install shop curve guardrail in accordance with the plans.

Posts may be power driven, or set by hand. Protect the top of steel posts by a suitable driving cap if power driven. If set by hand, dig post holes to the depth and at the locations shown in the plans. Thoroughly ram the bottom of the post holes so that the posts will have a stable foundation. Set the posts plumb and accurately space and line. Backfill the post holes in 6" layers with suitable material and thoroughly compact.

Where rock interferes with the proper installation of the post, excavate a shaft in the rock at least 9" wide, parallel to the roadway, by 23" long, perpendicular to the roadway and 24" deep. Place the post against the roadside edge of the shaft and fill in behind the post with Class VI select material, up to the top elevation of the rock. Fill the remainder of the hole with earth material. Where timber posts are to be driven in fill slopes 1.5:1 or steeper and the fill height is 15 ft or more, auger a 6" diameter pilot hole to the full depth of the post before driving.

Where steel posts are required to be installed at box culverts, weld the post to the anchor plate, cut off and align in accordance with the details shown in the plans or as directed.

Use the same type of guardrail posts and offset blocks throughout the project unless otherwise directed or detailed in the plans.

After galvanized guardrail has been erected, repair damaged coating in accordance with Article 1076-7.

When guardrail is being constructed near traffic, conduct operations to constitute the least hazard to the public. Schedule and conduct operations to construct and complete each individual continuous guardrail installation in the least possible time.

Do not begin work on any section of new guardrail until preparations are made to fully complete the installation of the section as a continuous operation. Once work begins on a section, pursue the work to its completion unless inclement weather or other conditions beyond the control of the Contractor interfere with the work. Begin attachment of the rail elements at the approach end of the guardrail and continue in the same direction as the movement of traffic.

When directed, install guardrail posts and blocks at locations that are in addition to those required by the plans.

Install tubular triple corrugated steel beam guardrail on concrete bridges or driven posts or at locations shown in the plans in accordance with the details shown in the plans and as directed. Where the tubular triple corrugated steel beam guardrail is to be mounted on concrete, use steel posts, weld the post to the anchor plate, cut off and align in accordance with the details shown in the plans or as directed.

862-4 GUARDRAIL DELINEATORS

Use any of the several alternate delineator types for guardrail shown in the plans, but only one delineator type for guardrail at any one time throughout the project.

The delineators consist of a reflector and base or casing. Attach the delineator to the guardrail as shown in the plans. Only one attachment position will be permitted throughout the project length.

Position delineators perpendicular to the centerline of the road. Use yellow delineators in the median and on the left side of one-way ramps, loops or other one-way facilities. Use crystal delineators on the right side of divided highways, ramps, loops and all other one-way or two-way facilities. In all cases, the color of the delineator shall supplement the color of the adjacent edgelines.

862-5 TEMPORARY GUARDRAIL

Temporary guardrail may be reused if it is in satisfactory condition. After temporary guardrail is no longer needed, it becomes the property of the Contractor. Remove the temporary guardrail from the project.

862-6 MEASUREMENT AND PAYMENT

Steel Beam Guardrail will be measured and paid in linear feet of guardrail that has been satisfactorily completed and accepted exclusive of that length of guardrail that is within the pay limits of guardrail anchors. Measurement will be made from center to center of the outermost post in the length of guardrail being measured.

Steel Beam Guardrail, Shop Curved will be measured and paid in linear feet of guardrail that has been satisfactorily completed and accepted exclusive of that length of guardrail that is within the pay limits of guardrail anchors. Measurement will be made from center to center of the outermost post in the length of guardrail being measured.

Steel Beam Guardrail, Double Faced will be measured and paid in linear feet of guardrail that has been satisfactorily completed and accepted exclusive of that length of guardrail that is within the pay limits of guardrail anchors. Measurement will be made from center to center of the outermost post in the length of guardrail being measured.

Triple Corrugated Steel Beam Guardrail will be measured and paid in linear feet of guardrail that has been satisfactorily completed and accepted exclusive of that length of guardrail that is within the pay limits of guardrail anchors. Measurement will be made from center to center of the outermost post in the length of guardrail being measured.

20" *Tubular Triple Corrugated Steel Beam Guardrail* will be measured and paid in linear feet of guardrail that has been satisfactorily completed and accepted exclusive of that length of guardrail that is within the pay limits of guardrail anchors. Measurement will be made from center to center of the outermost post in the length of guardrail being measured.

Temporary Steel Beam, Guardrail will be measured and paid in linear feet of guardrail that has been satisfactorily completed and accepted exclusive of that length of guardrail that is within the pay limits of guardrail anchors. Measurement will be made from center to center of the outermost post in the length of guardrail being measured.

Temporary Steel Beam Guardrail, Shop Curved will be measured and paid in linear feet of guardrail that has been satisfactorily completed and accepted exclusive of that length of guardrail that is within the pay limits of guardrail anchors. Measurement will be made from center to center of the outermost post in the length of guardrail being measured.

Temporary Steel Beam Guardrail, Double Faced will be measured and paid in linear feet of guardrail that has been satisfactorily completed and accepted exclusive of that length of guardrail that is within the pay limits of guardrail anchors. Measurement will be made from center to center of the outermost post in the length of guardrail being measured.

Steel Beam Guardrail Terminal Section and *Temporary Steel Beam Guardrail Terminal Sections* will be measured and paid in units of each completed and accepted, exclusive of terminal sections that are within the pay limits of guardrail anchors.

Triple Corrugated Steel Beam Guardrail Terminal Sections will be measured and paid in units of each completed and accepted, exclusive of terminal sections that are within the pay limits of guardrail anchors.

Guardrail Anchor Units, Type ____ and *Temporary Guardrail Anchor Units Type ____* will be measured and paid as units of each completed and accepted. No separate measurement will be made of any rail, terminal sections, posts, offset blocks, concrete, hardware or any other components of the completed unit that are within the pay limits shown in the plans for the unit as all such components will be considered to be part of the unit.

W-TR Steel Beam Guardrail Transition Sections will be measured and paid in units of each completed and accepted.

Additional Guardrail Posts will be measured and paid in units of each for additional posts required but not shown in the plans.

There will be no measurement or payment made for guardrail delineators or guardrail end delineation as they are incidental to the other pay items in this section.

Such price and payment includes, but is not limited to, furnishing and erecting posts, offset blocks, rail, terminal sections, miscellaneous hardware and all other materials; field curving and shop curving of the rail; removing temporary guardrail; excavation; furnishing and installing additional guardrail posts and additional offset blocks; backfilling; fabrication; welding; galvanizing; and furnishing and installing guardrail delineators and end delineation.

Payment will be made under:

Pay Item	**Pay Unit**
Steel Beam Guardrail	Linear Foot
Steel Beam Guardrail, Shop Curved	Linear Foot
Steel Beam Guardrail, Double Faced	Linear Foot
Triple Corrugated Steel Beam Guardrail	Linear Foot
20" Tubular Triple Corrugated Steel Beam Guardrail	Linear Foot
Temporary Steel Beam Guardrail	Linear Foot
Temporary Steel Beam Guardrail, Shop Curved	Linear Foot
Temporary Steel Beam Guardrail, Double Faced	Linear Foot
Temporary Guardrail Anchor Units, Type ____	Each
Temporary Steel Beam Guardrail Terminal Sections	Each
Steel Beam Guardrail Terminal Sections	Each
Triple Corrugated Steel Beam Guardrail Terminal Sections	Each
Guardrail Anchor Units, Type ____	Each
W-TR Steel Beam Guardrail Transition Sections	Each
Additional Guardrail Posts	Each

SECTION 863
REMOVE EXISTING GUARDRAIL AND GUIDERAIL

863-1 GENERAL

Dismantle, remove and dispose of existing guardrail, guiderail and anchors of any type at locations shown in the plans or established by the Engineer.

863-2 CONSTRUCTION METHODS

Remove guardrail, guiderail and posts beginning at the trailing end and continuing towards the approach end. Remove the posts immediately after the rail or cable is removed. Complete post removal so that no posts without rail or cable attached are present at the end of any day's operations. Exercise care not to damage adjoining structures or other appurtenances. Fill any void created by post or anchor removal and repair all damages. All guardrail, guiderail and components removed are the property of the Contractor.